1972 Index
Proceedings of the IEEE
Vol. 60

This index covers all items – papers, correspondence, reviews, etc. – that appeared in this periodical during 1972, and items from prior years that were commented upon or corrected in 1972. The index is divided into an Author Index and a Subject Index, both arranged alphabetically.

The *Author Index* contains the primary entry for each item; this entry is listed under the name of the first author and includes coauthor names, title, location of the item, and notice of corrections and comments if any. Cross-references are given from each coauthor name to the name of the corresponding first author. The location of the item is specified by the journal name (abbreviated), year, month, inclusive pages, and microfiche code. [The microfiche code, given in parentheses following the inclusive pages, consists of four characters to be interpreted as follows: the first character identifies the microfiche number within the set of fiches for the issue; the second character identifies the row in which the first frame of the particular item is located; and the last two characters designate the position of that frame within the row.]

The *Subject Index* contains several entries for each item, each consisting of a subject heading, modifying phrase(s), first author's name, and location of the item. For information on coauthors, title, comments and corrections if any, etc., it is necessary to refer to the Author Index. Some generic subject headings are used in this index in addition to the usual technical headings, e.g., *Books* (books reviewed in this periodical), *Bibliographies* (both papers that are bibliographies and any other papers which contain more than 50 references), *Conferences* (technical meetings a substantial number of whose abstracts or papers have appeared in this periodical), and *Special Issues* (issues of this periodical devoted primarily to a specific subject). The Subject Index includes subject cross-references as required by the subject matter.

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Monopole antennas; human body; admittance and radiation efficiency in 30–70 MHz range. *Andersen, J. Bach, PROC 72 Jul* 900-901 (3C11)
Moon; **cf.** Lunar
MOS devices; **cf.** MIS devices
MOSFETs; gate flicker noise; determination of whether excess gate noise is present and degree of correlation with drain flicker noise. *Haslett, J. W., PROC 72 Sep* 1111-1112 (2F02)
MOSFETs; self-heating and gate leakage current in guarded MOSFETs; self-heating effect on Schottky emission current. *Negro, Vincent C., PROC 72 Mar* 342-343 (2F05)
MOSFETs; **cf.** MOS transistors
MOS transistors; model; dc model that eliminates need for piecewise definition of channel current. *Kalinowski, Joseph J., PROC 72 Aug* 1000-1001 (2C12)
MOS transistors; **cf.** MOSFETs
Moving media; bianisotropic media; extension of classical theorems to bianisotropic media. *Arnaud, Jacques A., PROC 72 May* 639-640 (3F01)
Moving media; bianisotropic media; electromagnetic fields in linear nonconducting bianisotropic media. *Kong, Jin Au, PROC 72 Sep* 1036-1046 (1C08)
Moving media; bianisotropic media; proof that moving lossless bianisotropic medium remains lossless. *Lindell, Ismo V., PROC 72 Apr* 463-464 (3C09)
Moving media; constitutive parameters of moving anisotropic media; derivation using dyadic calculus; positive definiteness. *Lindell, Ismo V., PROC 72 May* 638-639 (3E12)
Moving media; magnetoelectric media; reciprocity relations for uniformly moving dispersive and nondispersive media. *Besieris, Ioannis M., PROC 72 Feb* 229-230 (2C07)
Moving target indicators; **cf.** MTI
MSM diodes; noise from velocity fluctuations of drifting carriers in depletion region. *Statz, Hermann, PROC 72 May* 644-645 (3F06)
MTI radar; MTI recursive digital filters for phased array radars; transient response improvement. *Fletcher, Robert H., Jr., PROC 72 Dec* 1551-1552 (2D03)
MTI radar; recursive digital filters; design in *z* plane. *Mark, John W., PROC 72 Jun* 728-729 (2C11)
MTI radar; recursive digital filters; improvement factor and passband characteristics. *Shrader, William W., PROC 72 Nov* 1442-1443 (4D09)
Multiplexing; computer communications; functional, economic, and application aspects. *Doll, Dixon R., PROC 72 Nov* 1313-1321 (2C09)
Multiplexing; computer communications; network processors based on minicomputers. *Newport, C. B., PROC 72 Nov* 1321-1322 (2D05)
Multiplexing; time-frequency accuracy requirements for FDM and TDM. *Smith, Warren L., PROC 72 May* 589-594 (2F11)
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Narrow-band; **cf.** Band-limited
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National Association of Securities Dealers Automated Quotations; computer network; description of terminal-oriented network. *Schwartz, Mischa, PROC 72 Nov* 1408-1423 (3F11)
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Near-field region; radar equations in Fresnel zone; Doppler effects. *Holtum, A. G., PROC 72 Jun* 748-749 (2E07)
Neodymium-doped lasers; **cf.** YAG lasers
Nets; **cf.** Communication nets
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Network analysis; susceptance determination given conductance; application to equivalent circuit of acoustic surface-wave transducer. *Nalamwar, A. L., PROC 72 Mar* 336-337 (2F09)
Network analysis; **cf.** Computer-aided circuit analysis; Equivalent networks; Network topology; Scattering matrices; Signal flow graphs; State-space methods; Tolerance analysis
Network models; acoustic waveguide discontinuities; equivalent networks for planar interfaces between two media. *Oliner, Arthur A., PROC 72 Dec* 1513-1518 (1F01)
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Networks; **cf.** Active networks; All-pass networks; Cascade networks; Communication nets; Delay networks; Distributed networks; Equivalent networks; Filters; Immittance inverters; Interconnected networks; Linear networks; Lossy networks; Nonlinear networks; *n*-port networks; Null networks; One-port networks; *RC* networks
Network synthesis; **cf.** Gyrators; Minimal realizations
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Network topology; active networks containing finite- or infinite-gain voltage amplifiers; topological formulas for driving-point and transfer functions. *Murata, Tadao, PROC 72 Nov* 1439-1440 (4D06)
Network topology; algebraic technique for describing element and subnetwork interconnections to computer; wiring operators. *Penfield, Paul, Jr., PROC 72 Jan* 49-53 (1F03)
Network topology; **cf.** Communication nets
Newton's method; nonlinear differential equations; numerical integration of implicit state equations using Newton's method. *Aprille, Thomas J., Jr., PROC 72 Jul* 902-903 (3D01)
Noise; cable communication two-way systems. *Harrer, J. R., PROC 72 Nov* 1453 (4E08)
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Noise; oscillator frequency fluctuations; model for flicker frequency noise. *Rutman, Jacques, PROC 72 Feb* 233-235 (2C11)
Noise; **cf.** Poisson noise; Semiconductor noise
Noise measurement; FETs and bipolar transistors; test set for measuring equivalent noise voltage and noise current generators. *Ayre, Robert W. A., PROC 72 Jan* 151 (3E08)
Noise measurement; voltage reference diodes; voltage drift prediction from low-frequency noise measurements. *Ringo, J. A., PROC 72 Feb* 236-237 (2D02)
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Nonlinear differential equations; numerical integration of implicit state equations using Newton's method. *Aprille, Thomas J., Jr., PROC 72 Jul* 902-903 (3D01)
Nonlinear differential equations; **cf.** Nonlinear partial differential equations
Nonlinear distributed systems; transform methods; *D* transforms. *Dasarathy, Belur V., PROC 72 Nov* 1438-1439 (4D05)
Nonlinear estimation; image enhancement procedures using recursive estimation. *Nahi, Nasser E., PROC 72 Jul* 872-877 (2F04)
Nonlinear networks; computer-aided analysis of nonlinear networks with periodic inputs; steady-state analysis. *Aprille, T. J., Jr., PROC 72 Jan* 108-114 (3B01)
Nonlinear networks; numerical integration of implicit state equations using Newton's method. *Aprille, Thomas J., Jr., PROC 72 Jul* 902-903 (3D01)
Nonlinear networks; synthesis using controllable gyrator and dc source. *Gossel, Dieter, PROC 72 Jul* 906-907 (3D05)
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Nonlinear programming; application to power flow analysis; optimal power flow solutions for power system planning. *Peschon, John, PROC 72 Jan* 64-70 (2B11)
Nonlinear stochastic systems; transformation of system with stochastic coefficients into deterministic system with stochastic inputs. *Harris, C. J., PROC 72 Jul* 904-905 (3D03)
Nonlinear systems; time-delay systems with large retardation; boundedness of solutions. *Sinha, A. S. C., PROC 72 Nov* 1437-1438 (4D04)
Nonlinear systems; **cf.** Nonlinear distributed systems
Nonlinear time-varying systems; stability; sufficient condition for feedback system which is open-loop unstable to be closed-loop unstable. *Vidyasagar, Mathukumalli, PROC 72 Jun* 762 (2F09)
Nonstationary stochastic processes; two-valued evolutionary processes; autocorrelation properties. *Kak, Subhash C., PROC 72 Aug* 1005-1006 (2D05)
***n*-port networks**; maximum power transfer theorem for multiterminal network to single impedance. *Mathis, Betty Ann, PROC 72 Jun* 746 (2E05)
***n*-port networks**; maximum power transfer theorem for active *n*-port networks. *Spinei, Fanica, PROC 72 Jul* 903-904 (3D02)
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Null networks; selectivity limit of lumped passive *RC* null networks. *Wilson, G., PROC 72 Jul* 911-912 (3D10)
Numerical integration; backward differentiation formulas for differential-algebraic systems. *Brayton, Robert K., PROC 72 Jan* 98-108 (2E09)
Numerical integration; digital differential analyzers versus digital computers; comparison of computation time. *Parasuraman, B., PROC 72 Mar* 324-326 (2D11)
Numerical integration; integrand approximation by fifth-order polynomials having continuous first derivatives at joining points. *Kuftez, Darko, PROC 72 Aug* 1015-1016 (2E03)
Numerical integration; nonlinear differential equations; numerical integration of implicit state equations using Newton's method. *Aprille, Thomas J., Jr., PROC 72 Jul* 902-903 (3D01)
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Numerical methods; **cf.** Matrix methods; Moment methods

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Omega navigation system; time dissemination via Omega VLF system. *Swanson, Eric R., PROC 72 May* 540-551 (2B10)
Omega navigation system; time-of-day information using digital code added to Omega format. *Fey, Lowell, PROC 72 May* 630 (3E04)
One-port networks; noise properties representation by two correlated noise noise sources; linear time-invariant networks. *Van Nie, A. G., PROC 72 Jun* 751-753 (2E10)
Optical absorption; **cf.** Infrared absorption

Optical correlation; distortion in output signal as function of separation between ultrasonic grating and correlation mask. *Pantani, Luca, PROC 72 Jun* 750-751 (2E09)
Optical couplers; cf. Optical directional couplers
Optical detection; linear estimation of signal; identity of optimal linear estimate with optimal nonlinear estimate if signal has gamma probability density. *Bolgiano, L. P., Jr., PROC 72 Apr* 449 (3B07)
Optical diffraction; acoustooptic page composer based on Bragg imaging. *Szentesi, O. I., PROC 72 Nov* 1461-1462 (4F04)
Optical diffraction; edge-diffraction cone; experimental results in agreement with geometrical theory of diffraction. *Senior, Thomas B. A., PROC 72 Nov* 1448 (4E03)
Optical directional couplers; thin-film devices; three-layered glass films on glass substrate; coupling between first and third layer. *Ihaya, Akira, PROC 72 Apr* 470-471 (3D04)
Optical filters; cf. Spatial filters
Optical measurement methods; surface roughness measurement using light scattering; nonstationary surface roughness. *Grabe, M., PROC 72 Mar* 339-340 (2F02)
Optical phonon interactions; indium antimonide; electron velocity measurements in region beyond avalanche breakdown. *Gandhi, Om P., PROC 71 May* 808-810 (2F01)
Optical pumping; cf. Arc lamp pumping
Optical radiation effects; cf. Electromagnetic radiation effects
Optical resonators; cf. Laser resonators
Optical scattering; rough surfaces; measurement of nonstationary surface roughness using light scattering. *Grabe, M., PROC 72 Mar* 339-340 (2F02)
Optical signal processing; cf. Electrooptical signal processing; Optical correlation
Optical waveguides; glass film with irregular boundary; correlation lengths and average deviation of irregular boundary of RF sputtered glass film. *Sumatsu, Y., PROC 72 Jun* 744-745 (2E03)
Optical waveguides; new Fraunhofer zone. *Vianna Camargo, L. M., PROC 72 Jan* 149-150 (3E06)
Optical waveguides; cf. Fiber waveguides
Optimal control; interconnected power systems; load frequency control. *Tacker, E. C., PROC 72 Apr* 1239-1241 (3C12)
Optimization techniques; cf. Computer-aided optimization; Dynamic programming; Linear programming; Nonlinear programming; Separable programming
Oscillators; amplitude control of harmonic oscillators; response time reduction by use of sampling techniques in control loop. *Meyer-Ebrecht, D., PROC 72 Jun* 736 (2D07)
Oscillators; frequency fluctuations; model for flicker frequency noise. *Rutman, Jacques, PROC 72 Feb* 233-235 (2C11)
Oscillators; unlocked driven oscillators; frequency spectrum of oscillator operating in modulated mode. *Deklava, Janez, PROC 72 Jan* 135-136 (3D04)
Oscillators; cf. Microwave oscillators; Millimeter-wave oscillators; Phase-locked oscillators; Semiconductor diode oscillators
Oscilloscopes; cf. Cathode-ray oscilloscopes

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Page composers; acoustooptic page composer based on Bragg imaging. *Szentesi, O. I., PROC 72 Nov* 1461-1462 (4F04)
Parametric amplifiers; pump noise effects in negative-resistance parametric amplifiers. *Chramiec, Jerzy, PROC 72 Jan* 149 (3E06)
Parametric amplifiers; X-band parametric amplifier using varactors with 800 GHz cutoff frequency; gallium arsenide Schottky-barrier diodes. *Dickens, Lawrence E., PROC 72 Mar* 328-329 (2E03)
Parametric devices; MIS and Schottky-barrier microstrip devices. *Hughes, Gary W., PROC 72 Nov* 1460-1461 (4F03)
Partial differential equations; cf. Laplace equation; Nonlinear partial differential equations
Pattern classification; interactive pattern analysis and classification systems. *Kanal, Laveen N., PROC 72 Oct* 1200-1215 (2D12)
Pattern recognition; analog and digital techniques; comparison. *Preston, Kendall, Jr., PROC 72 Oct* 1216-1231 (3B01)
Pattern recognition; biomedical signals; digital pattern recognition; present status. *Cox, Jerome R., Jr., PROC 72 Oct* 1137-1164 (1D01)
Pattern recognition; digital pattern recognition; special issue. *Proceedings of the IEEE, PROC 72 Oct*
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Pattern recognition; interactive pattern analysis and classification systems. *Kanal, Laveen N., PROC 72 Oct* 1200-1215 (2D12)
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Pattern recognition; remote sensing data for earth resources evaluation. *Nagy, George, PROC 72 Oct* 1177-1200 (2C01)
Pattern recognition; template matching; ordered search techniques. *Nagel, Roger N., PROC 72 Feb* 242-244 (2D08)
Pattern recognition; track-chamber data; extraction of data from photographs of high-energy reactions of subnuclear particles. *Strand, Richard C., PROC 72 Oct* 1122-1137 (1B10)
Pattern recognition; cf. Character recognition; Feature extraction; Feature selection
PCM; cf. DPCM
PCM systems; jitter suppression in chain of repeaters by use of scrambler. *Matsushita, Masahiko, PROC 72 Nov* 1455-1456 (4E10)
Periodic excitation; nonlinear networks; computer-aided steady-state analysis. *Aprille, T. J., Jr., PROC 72 Jan* 108-114 (3B01)
Periodic processes; mean-square periodic processes for which the autocorrelation function $|R(\tau)| \leq R(0)$. *Knight, Joseph A., PROC 72 Jun* 755-756 (2F02)
Phase-coded signals; acoustic surface-wave transducer for generation and correlation of 4-phase 15-bit generalized Barker sequence. *van de Vaart, H., PROC 72 Apr* 454-455 (3B12)
Phased array radar; MTI recursive digital filters for phased array radars; transient response improvement. *Fleicher, Robert H., Jr., PROC 72 Dec* 1551-1552 (2D03)
Phase-locked oscillators; dc to RF conversion efficiency of oscillators using negative resistance devices; comparison of definitions of efficiency. *Quine, J. P., PROC 72 Sep* 1112-1113 (2F03)
Phase-locked oscillators; distortion of FM modulation in detuned injection phase-locked oscillator–amplifiers. *Nagrin, J., PROC 72 Jun* 731-732 (2D02)
Phase-locked oscillators; FM distortion in injection-locked oscillators–amplifiers; dependence of total nonlinear and delay distortion on modulation frequency. *Nagrin, J., PROC 72 Apr* 458-459 (3C04)
Phase-locked oscillators; injection-locked oscillators; stability of locking with large signal injection. *Kurokawa, Kaneyuki, PROC 72 Jul* 907-908 (3D06)
Phase modulation; cf. PM
Phase shifters; cf. Semiconductor phase shifters
Phase-shift keying; cf. PSK
Phonon interactions; cf. Optical phonon interactions
Photoconducting materials; electrophotography; processes, materials, and technologies; review paper. *Comizzoli, Robert B., PROC 72 Apr* 348-368 (1B06)
Photodetection; cf. Optical detection
Photodiode arrays; image scanner using acoustic surface waves with tapped electrodes and photodiode arrays. *Asakawa, Kiyoshi, PROC 72 Jul* 920-921 (3E07)
Photography; cf. Aerial photography; Astronomical photography; Electrophotography
Photovoltaic cells; cf. Solar cells
Picture processing; cf. Image processing
Piezoelectric semiconductors; cf. Cadmium sulfide
Piezoelectric waveguides; generalized treatment; normal mode expansion of elastic and electric fields. *Makimoto, Toshio, PROC 72 Jun* 733-734 (2D04)
Planar devices; Schottky-barrier gate devices; logic and memory applications. *Sugata, T., PROC 72 Feb* 238-240 (2D04)
Planar digital filters; image processing; algorithms for spatial frequency filtering. *Hall, Ernest L., PROC 72 Jul* 887-891 (3B10)
Planetary exploration; digital image processing; recent developments at Jet Propulsion Laboratory. *O'Handley, Douglas A., PROC 72 Jul* 821-828 (2B01)
Plasma diagnostics; time-domain method for measuring reflection coefficient of electron density profile as function of frequency. *Baird, A. W., III, PROC 72 Jun* 754-755 (2F01)
Plasma generation; pulsed metallic-plasma generators; vacuum arc as plasma source. *Gilmour, Alexander S., Jr., PROC 72 Aug* 977-991 (2B01)
Plasmas; moving magnetoelectric media; reciprocity relations for uniformly moving dispersive and nondispersive media. *Besieris, Ioannis M., PROC 72 Feb* 229-230 (2C02)
Plasmas; cf. Electromagnetic propagation in plasmas
Plasma waves; two-stream electrostatic instability. *Seshadri, S. R., PROC 72 Oct* 1234-1235 (3C07)
PLZT ceramics; electrooptic operation; longitudinal mode of operation applicable to free or bonded plates. *Haertling, G. H., PROC 72 Apr* 450-451 (3B08)
PM demodulation; Gaussian–Markov random channels; demodulator–estimator derivation using conditional mean criterion. *Mark, John W., PROC 72 Apr* 471-472 (3D05)
PM filters; bandpass filters for narrow-band systems; computer-aided design of minimum-distortion filters. *Shelton, Robert D., PROC 72 Jan* 127-128 (3C08)
Point contact diodes; cf. Metal-to-metal point contact diodes
Poisson noise; linear estimation of signal in Poisson noise; optimal linear estimate shown to be identical to optimal nonlinear estimate if signal has gamma probability density. *Bolgiano, L. P., Jr., PROC 72 Apr* 449 (3B07)
Pollution; cf. Environmental pollution
Polynomials; factorization algorithm. *Tessler, Lawrence, PROC 72 Jun* 737-738 (2D08)
Polynomials; factorization using Routh criterion. *Mastascusa, Edward J., PROC 71 Sep* 1358-1359 (3E05)
Polynomials; relative primeness of two multivariable polynomials; necessary and sufficient conditions. *Bose, Nirmal K., PROC 72 Jan* 134-135 (3D03)
Potential function methods; feature selection in pattern recognition. *Chitti Babu, C., PROC 72 Mar* 333-334 (2E08)
Power flow analysis; optimal solutions for power system planning; computer-aided analysis. *Peschon, John, PROC 72 Jan* 64-70 (2B11)
Power system analysis; cf. Computer-aided power system analysis
Power system control; cf. Load frequency control
Power system operation; cf. Computer-aided power system operation
Power system planning; power flow analysis for system planning; optimal power flow solutions. *Peschon, John, PROC 72 Jan* 64-70 (2B11)
Power systems; cf. Interconnected power systems
Power system transients; lossy transmission lines; equivalent representation for short duration surges. *Shah, Kanaiyalal R., PROC 71 Aug* 1258-1259 (3C05)
Primeness; relative primeness of two multivariable polynomials; necessary and sufficient conditions. *Bose, Nirmal K., PROC 72 Jan* 134-135 (3D03)
Printing; cf. Electrophotography
Probability functions; cumulative probability distribution; calculation from moment-generating function; numerical method. *Wang, Lily, PROC 72 Nov* 1452-1453 (4E07)
Proton radiation effects; laser diode fabrication; proton-bombardment formation of stripe-geometry heterostructure lasers. *Dyment, J. C., PROC 72 Jun* 726-728 (2C09)
PSK modulators; millimeter-wave path-length modulator using p-i-n diode switch; 100–110 GHz range. *Clemetson, W. J., PROC 72 Jul* 912-913 (3D11)
Psychooptics; fidelity criteria for visual communication systems; TV distortion. *Budrikis, Zigmantas L., PROC 72 Jul* 771-779 (1B11)
Psychooptics; image processing; subjective distortion in processed images. *Stockham, Thomas G., Jr., PROC 72 Jul* 828-842 (2B08)
Pulsar signals; time transfer system using near-synchronous reception of optical pulsar signals. *Allan, David W., PROC 72 May* 625-627 (3D11)
Pulse-code modulation; cf. PCM
Pulse compression techniques; FSK signal detection using linear FM dispersion method. *Murarka, Narayan P., PROC 72 Apr* 469-470 (3D03)
Pulse compression techniques; gamma radiography; acoustic imaging technique. *Barrett, Harrison H., PROC 72 Jun* 723-724 (2C06)
Pulse generators; gallium arsenide Gunn diode with Schottky-barrier control gate; bias operation. *Takeuchi, M., PROC 72 Jun* 740-741 (2D11)
Pulse generators; rate multiplier with evenly spaced output pulses. *Reddy, V. C. V. Pratapa, PROC 72 Jun* 759 (2F06)
Pulse propagation; cf. Electromagnetic transient propagation
Pulse transformers; transmission-line transformers. *Matick, Richard E., PROC 68 Jan* 47-62
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Pyrolytic graphite; electromagnetic propagation in electrically asymmetric pyrolytic graphite. *Saha, A. R., PROC 72 Jan* 140-142 (3D09)

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Q-switching; electrooptic technique not requiring linear polarization of laser energy. *Wentz, John L., PROC 72 Mar* 343-344 (2F06)
Quantization; fast Fourier transform coefficients; effect on frequency response of any frequency bin. *Tufts, D. W., PROC 72 Jan* 146-147 (3E03)
Quantization errors; digital filtering and fast Fourier transform; effect of finite register length. *Oppenheim, Alan V., PROC 72 Aug* 957-976 (1E01)
Quantized signals; mean of noisy analog signal; estimation from mean after quantization. *Gedance, Alan R., PROC 72 Aug* 1007-1008 (2D08)
Quartz devices; acoustic surface-wave transducer for generation and correlation

of 4-phase 15-bit generalized Barker sequence. *van de Vaart, H., PROC 72 Apr* 454-455 (3B12)
Queuing theory; computer-communications; message switching and line switching techniques. *Doll, Dixon R., PROC 72 Nov* 1313-1321 (2C09)
Queuing theory; computer communications; software. *Mills, David L., PROC 72 Nov* 1333-1341 (2E05)
Queuing theory; message-switching networks; waiting-time probability distributions for networks with minimized average network delay or minimized maximum of all link or node delays. *Meister, Bernd, PROC 72 Jun* 749-750 (2E08)

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Radar; *cf.* Doppler radar; Lunar radar; MTI radar; Phased array radar; Search radar; Synthetic-aperture radar
Radar applications; road-vehicle steering systems; Doppler system that causes vehicle to turn towards areas of minimum reflectivity. *Cosgriff, Robert L., PROC 72 Sep* 1100-1101 (2E03)
Radar applications; time synchronization via lunar radar. *Higa, Walter H., PROC 72 May* 552-557 (2C10)
Radar detection; collapsing losses in linear and square-law detectors. *Trunk, Gerard V., PROC 72 Jun* 743-744 (2E02)
Radar detection; constant false alarm rate circuit using matched dispersive delay lines preceding and following a hard limiter. *Ward, Harold R., PROC 72 Jun* 735-736 (2D06)
Radar detection; CW radar output for arbitrary-amplitude sinusoidal phase disturbance; relationship between output amplitude spectrum and local oscillator amplitude spectrum. *Patterson, Joseph T., PROC 72 Apr* 468 (3D02)
Radar detection; Doppler effects in Fresnel zone; generalized radar equations. *Holtum, A. G., PROC 72 Jun* 748-749 (2E07)
Radar detection; sequential two-pulse detection scheme; comparison with single-pulse detection. *van der Spek, G. A., PROC 72 Oct* 1242 (3D03)
Radar mapping; airborne mapping of terrain using narrow pulsewidths; high resolution even with wide-beam antennas. *Kazel, Sidney, PROC 72 Apr* 1238-1239 (3C11)
Radar signal processing; MTI recursive digital filters; design in z plane. *Mark, John W., PROC 72 Jun* 728-729 (2C11)
Radar signal processing; MTI recursive digital filters; improvement factor and passband characteristics. *Shrader, William W., PROC 72 Nov* 1442-1443 (4D09)
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Radiation detectors; track-chamber data extraction; digital pattern recognition. *Strand, Richard C., PROC 72 Oct* 1122-1137 (1B10)
Radiation effects; *cf.* Biological radiation effects; Electromagnetic radiation effects; Electron radiation effects; Proton radiation effects; Semiconductor irradiation effects
Radiation safety; biological effects of nonionizing radiation; hazards and safety standards. *Michaelson, Sol M., PROC 72 Apr* 389-421 (2B01)
Radiography; digital signal processing; recent developments at Jet Propulsion Laboratory. *O'Handley, Douglas A., PROC 72 Jul* 821-828 (2B01)
Radiography; holograms of X-ray information; three-dimensional image from composite hologram of stack of X-ray exposures. *Kock, Winston E., PROC 72 Nov* 1458-1459 (4B01)
Radiography; pulse compression techniques for gamma radiography; acoustic imaging. *Barrett, Harrison H., PROC 72 Jun* 723-724 (2C06)
Radio interferometry; long-baseline interferometry using independent atomic frequency standards. *Klemperer, Wilfred Konrad, PROC 72 May* 602-609 (3B12)
Radio interferometry; *cf.* Microwave interferometry
Radio navigation; *cf.* Loran-C; Omega navigation system; Satellite navigation systems
Radio telescopes; electrooptical signal processing; generation of visible images of astronomical radio sources. *Stark, Henry, PROC 72 Aug* 1009-1010 (2D10)
Radiowave propagation; frequency dissemination signals; path delay calculations. *Winkler, Gernot M. R., PROC 72 May* 522-529 (1F04)
Radiowave propagation; *cf.* Ionospheric propagation
Random processes; *cf.* Stochastic processes
Rate-distortion theory; review; application to video sources. *Davisson, Lee D., PROC 72 Jul* 800-808 (1E04)
Rate-distortion theory; visual communications; fidelity criteria and modeling. *Budrikis, Zigmantas L., PROC 72 Jul* 771-779 (1B11)
Rate-multipliers; binary rate-multiplier circuit using identical flip-flop stages. *Elliott, A. Ronald, PROC 71 Aug* 1256-1257 (3C03)
Rate-multipliers; evenly spaced output pulses. *Reddy, V. C. V. Pratapa, PROC 72 Jun* 759 (2F06)
Ray optics; *cf.* Geometrical optics
***RC* filters**; *cf.* Active *RC* filters; Distributed *RC* filters
***RC* networks**; null networks; selectivity limit of lumped passive *RC* null networks. *Wilson, G., PROC 72 Jul* 911-912 (3D10)
***RC* networks**; *cf.* Active *RC* networks; Distributed *RC* networks
Read diodes; current generation in avalanche region; exact solution. *Nigrin, J., PROC 72 Jul* 916-917 (3E03)
Read diodes; nonlinear properties; large-signal parametric effects, frequency conversion, and noise generation. *Hines, Marion E., PROC 72 Dec* 1534-1548 (2B10)
Realization theory; *cf.* Minimal realizations
Recursive digital filters; MTI filters in phased array radars; transient response improvement. *Fletcher, Robert H., Jr., PROC 72 Dec* 1551-1552 (2D03)
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Sweden; data transmission networks; plans for public data network. *Sjöström, Olov R., PROC 72 Nov* 1378-1381 (3D05)
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Switzerland; data transmission systems; plans for future networks. *Neu, Walter, PROC 72 Nov* 1382-1384 (3D09)
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Thin-film resistors; computer-aided design of diffused resistors; RESIST time-sharing computer program. *Chawla, Basant R., PROC 72 Jun* 151-152 (3E08)
Thin-film transistors; indium antimonide FETs; high transconductance and well-defined saturation region. *Luo, F. C., PROC 72 Aug* 997-999 (2C09)
Thin-film waveguides; glass film with irregular boundary; correlation lengths and average deviation of irregular boundary of RF sputtered glass film for optical waveguides. *Suematsu, Y., PROC 72 Jun* 744-745 (2E03)
TIMATION satellites; navigation satellites; time–frequency aspects and passive navigation techniques. *Easton, Roger L., PROC 72 May* 557-563 (2D03)
Time-delay measurement; low-frequency technique for measurement of small delay times; application to transistor transit time measurement. *Zakarevicius, R. A., PROC 72 Jul* 910-911 (3D09)
Time-delay systems; nonlinear second-order systems with large retardations; boundedness of solutions. *Sinha, A. S. C., PROC 72 Nov* 1437-1438 (4D04)
Time-delay systems; sampled-data systems with time delays equal to, or greater than, the multirate sampling interval; input–output relationship. *Kuo, Te-Son, PROC 72 Feb* 226-227 (2C04)
Time dissemination; Loran-C navigation system. *Potts, Cyrus E., PROC 72 May* 530-539 (1F12)
Time dissemination; satellite navigation systems; Navy Navigation Satellite System and TIMATION satellites. *Easton, Roger L., PROC 72 May* 557-563 (2D03)
Time dissemination; special issue. *Proceedings of the IEEE, PROC 72 May*
Time dissemination; special issue introduction. *Jespersen, James L., Guest ed., PROC 72 May* 476-478 (1B06)
Time dissemination; system design considerations in signal design; dissemination methods. *Jespersen, James L., PROC 72 May* 502-521 (1D08)
Time dissemination; time-of-day information from Omega navigation system; digital code added to Omega format. *Fey, Lowell, PROC 72 May* 630 (3E04)
Time dissemination; via TV signals; NBS sponsored experiment using active time and frequency code transmitted over US TV network. *Howe, David A., PROC 72 May* 634-637 (3E08)
Time dissemination; VLF techniques; Omega navigation system. *Swanson, Eric R., PROC 72 May* 540-551 (2B10)
Time dissemination; cf. Frequency dissemination; Time–frequency applications; Time standards; Time synchronization
Time-division multiplexing; cf. TDM
Time–frequency applications; aircraft collision advoidance based on time–frequency synchronization. *Perkinson, Robert E., PROC 72 May* 572-579 (2E06)
Time–frequency applications; communication systems; time–frequency accuracy requirements for FDM and TDM. *Smith, Warren L., PROC 72 May* 589-594 (2F11)
Time–frequency applications; geodesy. *Carter, William E., PROC 72 May* 610-613 (3C08)
Time–frequency applications; measurement standards; unified standard for frequency, time, and length. *Halford, Donald, PROC 72 May* 623-625 (3D09)
Time–frequency applications; navigation satellite systems; time–frequency aspects of Navy Navigation Satellite System and TIMATION satellites. *Easton, Roger L., PROC 72 May* 557-563 (2D03)
Time–frequency applications; radio interferometry; long-baseline interferometry using independent atomic frequency standards. *Klemperer, Wilfred Konrad, PROC 72 May* 602-609 (3B12)
Time–frequency applications; road-vehicle location systems for urban environment. *Roth, S. H., PROC 72 May* 637-638 (3E11)
Time–frequency applications; satellite navigation systems; time and frequency accuracy required for active systems. *Ehrlich, Eugene, PROC 72 May* 564-571 (2D10)
Time–frequency applications; TDM systems; synchronization of digital signal sources. *Pan, John W., PROC 72 May* 594-601 (3B04)
Time–frequency applications; transportation via air, land, and sea; current and future problems. *Potts, Cyrus E., PROC 72 May* 579-589 (2F01)
Timepieces; circuitry for wristwatches; integrated circuits. *Forrer, Max P., PROC 72 Sep* 1047-1054 (1D07)
Time-sharing computer systems; hybrid computer system for computer-aided design of dynamic systems. *Howe, R. M., PROC 72 Jun* 71-77 (1C06)
Time standards; atomic time scales; international coordinated time scale. *Kartaschoff, Peter, PROC 72 May* 493-501 (1C11)
Time standards; dissemination and applications; special issue. *Proceedings of the IEEE, PROC 72 May*
Time standards; dissemination and applications; special issue introduction. *Jespersen, James L., Guest ed., PROC 72 May* 476-478 (1B06)
Time standards; international coordination in time determination and dissemination. *Smith, Humphry Montague, PROC 72 May* 479-487 (1B09)
Time standards; national requirements; assistance available to countries desiring to establish time and frequency systems. *Henderson, John Tasker, PROC 72 May* 487-493 (1C05)
Time standards; unified standard for time, frequency, and length; use of time–frequency metrology. *Halford, Donald, PROC 72 May* 623-625 (3D09)
Time standards; universal time determination using lunar laser ranging. *Carter, William E., PROC 72 May* 610-613 (3C08)
Time standards; cf. Frequency standards; Time dissemination
Time synchronization; data communication systems; line control procedures. *Gray, James P., PROC 72 Nov* 1301-1312 (2B09)

Time synchronization; lunar radar method of time synchronization. *Higa, Walter H., PROC 72 May* 552-557 (2C10)
Time synchronization; NASA Spacecraft Tracking and Data Network synchronization using NASA Geodetic Earth Orbiting Satellite. *Laios, Straton C., PROC 72 May* 632-633 (3E06)
Time synchronization; optical pulsar and TV time transfer systems using near-synchronous reception. *Allan, David W., PROC 72 May* 625-627 (3D11)
Time synchronization; satellite control networks synchronization using TRANSIT satellite signals. *Laidet, L. M., PROC 72 May* 630-632 (3E04)
Time synchronization; TDM synchronization of digital signal sources. *Pan, John W., PROC 72 May* 594-601 (3B04)
Time synchronization; TDM systems; time-frequency accuracy requirements. *Smith, Warren L., PROC 72 May* 589-594 (2F11)
Time synchronization; use of ATS-3 with two C-band transponder channels. *Mazur, Wilfred E., Jr., PROC 72 May* 633-634 (3E07)
Time synchronization; cf. Time dissemination
Time terminology; time interval and moment on time scale. *Winkler, Gernot M. R., PROC 72 May* 638 (3E12)
Time-varying channels; demodulator-estimator for Gaussian-Markov random channels. *Mark, John W., PROC 72 Apr* 471-472 (3D05)
Time-varying systems; cf. Nonlinear time-varying systems; Stochastic systems
Timing jitter; PCM systems; jitter suppression by scrambling. *Matsushita, Masahiko, PROC 72 Nov* 1455-1456 (4E10)
Tolerance analysis; networks; separable programming to determine tolerances of components to minimize total cost of network. *Hamza, Mohamed H., PROC 72 Mar* 332-333 (2E07)
Track-chamber data; digital pattern recognition; extraction of data from photographs of high-energy reactions of subnuclear particles. *Strand, Richard C., PROC 72 Oct* 1122-1137 (1B10)
Traffic control; cf. Air-traffic control
Transducer arrays; adaptive arrays; least-mean squares algorithm for adjusting array in real time to respond to signal while discriminating against noise. *Frost, Otis Lamont, III, PROC 72 Aug* 926-935 (1B06)
Transducer models; acoustic surface-wave transducer equivalent circuit; radiation susceptance determination given conductance. *Nalamwar, A. L., PROC 72 Mar* 336-337 (2F09)
Transducers; cf. Acoustic surface-wave transducers; Biomedical transducers; Strain gages
Transferred-electron amplifiers; stability of supercritical n-GaAs transferred-electron amplifier with ohmic contacts; effect of diffusion coefficient–electric field characteristic. *Teppuan, Palle, PROC 72 Apr* 452-454 (3B10)
Transferred-electron amplifiers; traveling-wave transistors; microwave amplifier using transferred-electron effect to augment transistor-like gain and isolation mechanisms; epitaxial layer of n-type GaAs grown on semi-insulating GaAs substrate. *Dean, Raymond H., PROC 72 Dec* 1486-1502 (1C10)
Transferred-electron amplifiers; frequency conversion; highly stabilized self-oscillating, up-converter, self-oscillating frequency. 20.1 GHz, signal frequency 1.5 GHz, output frequency 18.6 GHz. *Kobayama, K., PROC 72 Jun* 739-740 (2D10)
Transferred-electron oscillators; harmonic voltages in addition to fundamental for efficiency improvement; optimization of efficiency by adjustment of magnitudes and phases of harmonics. *Johnston, R. H., PROC 72 Nov* 1449-1451 (4E04)
Transferred-electron oscillators; indium phosphide oscillators; avalanche effects in bulk InP microwave oscillators. *Jervis, B. W., PROC 72 Jun* 722-723 (2C05)
Transferred-electron oscillators; cf. Gunn oscillators
Transformers; cf. Transmission-line transformers
Transforms; for nonlinear partial differential equations; *D* transform. *Dasarathy, Belur V., PROC 72 Nov* 1438-1439 (4D05)
Transforms; cf. *D* transforms; Fast Fourier transforms; Haar transforms; Hadamard transforms; Hilbert transforms; Laplace transforms; *z* transforms
Transient analysis; calculation of inverse of Laplace transform; rational function of complex frequency. *Muraleedharan, K. A., PROC 72 Aug* 995 (2C07)
Transient analysis; cf. Electromagnetic transient analysis; Power system transients
Transistor amplifiers; stabilization of two-transistor RF amplifier using single resistive element that dissipates no RF power. *Nelson, David E., PROC 72 Jun* 740 (3D09)
Transistor circuits; delay circuit using charge-storage effect in junction transistors. *Lee, Chu-Hsien, PROC 72 Apr* 466-467 (3C12)
Transistor circuits; Stark modulator for microwave spectroscopy. *Kukolich, Stephen G., PROC 72 Jan* 136-137 (3D05)
Transistor models; bipolar transistor modeling for computer-aided circuit design. *Logan, John, PROC 72 Jan* 78-85 (2D01)
Transistor models; bipolar transistors; Early effect modeling using an empirical parameter. *Logan, John, PROC 72 Mar* 335 (2E10)
Transistor models; bipolar transistors; Early effect modeling. *Clark, Lowell E., PROC 72 Nov* 1445-1446 (4D12)
Transistor models; bipolar transistors; large-signal models for computer-aided circuit design. *Fossum, J. G., PROC 72 Jun* 756-757 (2F03)
Transistor models; computer-aided modeling of junction devices; DTRAN transient analysis program for one-dimensional analysis. *Hachtel, Gary D., PROC 72 Jan* 86-98 (2D09)
Transistor models; MOS transistors; dc model that eliminates need for piecewise definition of channel current. *Kuhnowski, Joseph J., PROC 72 Aug* 1000-1001 (2C12)
Transistors; transistor input parameter variations that indicate high-gain frequency multiplication properties. *O'Clock, George D., Jr., PROC 72 Feb* 244-245 (2D10)
Transistors; cf. Bipolar transistors; FETs; Junction transistors; Thin-film transistors; Traveling-wave transistors
TRANSIT satellites; synchronization of satellite control networks using TRANSIT signal. *Laidet, L. M., PROC 72 May* 630-632 (3E04)
Transmission lines; lossy lines; equivalent representation for short-duration surges. *Shah, Kanayalal R., PROC 71 Aug* 1258-1259 (3C05)
Transmission lines; cf. Coupled transmission lines
Transmission-line transformers; pulse transformers. *Matick, Richard E., PROC 68 Jan* 47-62
Transportation; time-frequency technology applications to transportation problems; air, land, and sea transportation. *Potts, Cyrus E., PROC 72 May* 579-589 (2F01)
Transportation; cf. Road transportation
TRAPATT oscillators; noise measurements on double-sided CW silicon oscillators. *Evans, W. J., PROC 72 Jan* 125-126 (3C06)
TRAPATT oscillators; *S*-band pulsed power of 325 W from two chips mounted in series in single micropill package. *Clorfeine, Alvin S., PROC 72 Jun* 729-730 (2C12)
TRAPATT oscillators; *X*-band efficiency of over 40%; silicon diodes with steep doping gradient at epitaxial layer substrate interface and low parasitic series resistance. *Grace, M. I., PROC 72 Nov* 1443-1444 (4D10)
Traveling-wave transistors; microwave amplifier using transferred-electron effect to augment transistor-like gain and isolation mechanisms; epitaxial layer of n-type GaAs grown on semi-insulating GaAs substrate. *Dean, Raymond H., PROC 72 Dec* 1486-1502 (1C10)
Trigger circuits; tunnel-diode bistable triggers; threshold behavior for trapezoidal and triangular input pulses. *Sarnot, S. L., PROC 72 Apr* 462-463 (3C08)
Tropospheric scattering; cf. Atmospheric scattering
Tunnel-diode circuits; binary counter using tunnel diode in collector–emitter lead of transistor. *Sarnot, S. L., PROC 72 Apr* 461-462 (3C07)
Tunnel-diode circuits; full binary adder using tunnel diode and transistor. *Tan, Z. C., PROC 72 Nov* 1241 (3D02)
Tunnel-diode circuits; trigger circuits, bistable; threshold behavior for trapezoidal and triangular input pulses. *Sarnot, S. L., PROC 72 Apr* 462-463 (3C08)
Turbulent media; backscattering by turbulent irregularities. *Wheelon, Albert D., PROC 72 Mar* 252-265 (1B06)
TV; cf. Cable TV
TV camera tubes; cf. Vidicons
TV distortion; visual fidelity criteria; rate-distortion theory. *Budrikis, Zigmantas L., PROC 72 Jul* 771-779 (1B11)
TV signals; coding; interframe coding techniques. *Haskell, Barry G., PROC 72 Jul* 792-800 (1D08)
TV signals; coding; intraframe coding techniques. *Connor, Denis J., PROC 72 Jul* 779-791 (1C07)
TV signals; coding; rate-distortion theory. *Davisson, Lee D., PROC 72 Jul* 800-808 (1E04)
TV signals; digital processing of spacecraft images; recent developments at Jet Propulsion Laboratory. *O'Handley, Douglas A., PROC 72 Jul* 821-828 (2B01)
TV signals; time and frequency dissemination via TV signals; NBS sponsored experiment using active time and frequency code transmitted over US TV network. *Howe, David A., PROC 72 May* 634-637 (3E08)
TV signals; time transfer system using near-synchronous reception from common transmitter. *Allan, David W., PROC 72 May* 625-627 (3D11)
TYMNET; terminal-oriented computer-communication network; description. *Schwartz, Mischa, PROC 72 Nov* 1408-1423 (3F11)

U

Underwater acoustics; detection of underwater sound source by microwave radiation reflected from water surface. *Tremain, D. E., PROC 72 Jun* 741-742 (2D12)
Units; cf. Measurement units
Universal Time Coordinated; cf. UTC
US Federal Communications Commission; computer communications; FCC policies and actions. *Mathison, Stuart L., PROC 72 Nov* 1254-1272 (1C02)
US NASA; time synchronization of Spacecraft Tracking and Data Network using Geodetic Earth Orbiting Satellite. *Laios, Straton C., PROC 72 May* 632-633 (3E06)
US Navy; navigation satellite systems; time-frequency aspects of Navy Navigation Satellite System and TIMATION satellites. *Easton, Roger L., PROC 72 May* 557-563 (2D03)
US NBS; time–frequency dissemination via TV signals; NBS sponsored experiment using active time and frequency code transmitted over US TV network. *Howe, David A., PROC 72 May* 634-637 (3E08)
UTC system; time determination and dissemination coordination on international basis. *Smith, Humphry Montague, PROC 72 May* 479-487 (1B09)

V

Vacuum arc devices; plasma generators; pulsed metallic-plasma generator using vacuum arc as plasma source. *Gilmour, Alexander S., Jr., PROC 72 Aug* 977-991 (2B01)
Varactor diodes; gallium arsenide Schottky-barrier varactors with 800 GHz cutoff frequency; use in *X*-band parametric amplifiers. *Dickens, Lawrence E., PROC 72 Mar* 328-329 (2E03)
Vehicle control; cf. Road-vehicle control
Vehicle location systems; cf. Road-vehicle location systems
Velocity measurement; cf. Laser velocimeters
Videophone signals; interframe coding techniques. *Haskell, Barry G., PROC 72 Jul* 792-800 (1D08)
Vidicons; Bivicon; 1½-inch vidicon with two guns and targets for color TV. *Spalding, R. L., PROC 72 Oct* 1236-1237 (3C09)
Visual systems; cf. Human visual systems
VLF time dissemination; Omega navigation system; historical evolution of VLF timing. *Swanson, Elmer R., PROC 72 May* 540-551 (2B10)
Voltage breakdown; stored-charge FETs; gate-controlled junction breakdown. *Spence, Wendell, PROC 72 Aug* 996-997 (2C08)
Voltage breakdown; cf. Dielectric breakdown
Voltage measurement; use of capacitor plate deflection to measure voltage; strain gage that measures displacement of plate. *Singh, Ved Ram, PROC 72 Jun* 740 (2D11)
Voltage reference diodes; voltage drift prediction from low-frequency noise measurements. *Ringo, J. A., PROC 72 Feb* 236-237 (2D02)

W

Walsh transforms; cf. Hadamard transforms
Watches; cf. Timepieces
Wave diffraction; cf. Acoustic diffraction; Electromagnetic diffraction
Waveform generators; cf. Pulse generators
Waveguides; square waveguides with inner circular boundary; calculation of cutoff frequencies. *Laura, Patricio A., PROC 72 Apr* 451-452 (3B09)
Waveguides; cf. Acoustic waveguides; Dielectric waveguides; Optical waveguides
Wave propagation; cf. Electromagnetic propagation
Wave scattering; cf. Acoustic scattering; Electromagnetic scattering
Weapons detection; microwave holography for concealed weapons detection; real-time display of hologram using liquid crystals. *Kock, Winston E., PROC 72 Sep* 1105 (2E08)
Western Union Telegraph Co.; data transmission services. *Cox, John E., PROC 72 Nov* 1350-1357 (3B01)
Wristwatches; cf. Timepieces

X

X-ray imaging; cf. Radiography

Y

YAG lasers, neodymium-doped; pumping; RF-excited krypton arc lamps. *Huchital, D. A., PROC 72 Feb* 233 (2C11)

Z

Zeros; cf. Polynomials
***z* transforms**; multirate *z* transforms for sampled-data systems containing time delays equal to, or greater than, the multirate sampling interval. *Kuo, Te-Son, PROC 72 Feb* 226-227 (2C04)